

Title (en)  
DIAMOND SEMICONDUCTOR ELEMENT AND METHOD FOR MANUFACTURING SAME

Title (de)  
DIAMANTHALBLEITERBAUELEMENT UND HERSTELLUNGSVERFAHREN DAFÜR

Title (fr)  
ÉLÉMENT SEMI-CONDUCTEUR EN DIAMANT ET SON PROCÉDÉ DE FABRICATION

Publication  
**EP 1895579 A4 20090610 (EN)**

Application  
**EP 06766995 A 20060620**

Priority  

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Abstract (en)  
[origin: EP1895579A1] In a conventional diamond semiconductor element, because of high density of crystal defects, it is impossible to reflect the natural physical properties peculiar to a diamond, such as high thermal conductivity, high breakdown field strength, high-frequency characteristics and the like, in the transistor characteristics. By slightly shifting surface orientation of a diamond substrate in a [001] direction, a significant reduction in crystal defects peculiar to a diamond is possible. The equivalent effects are also provided by shifting surface orientation of a single-crystal diamond thin-film or channel slightly from a [001] direction. It is possible to obtain a significantly high transconductance gm as compared with that in a transistor produced using conventional surface orientation.

IPC 8 full level  
**H01L 21/338** (2006.01); **C23C 16/27** (2006.01); **C30B 29/04** (2006.01); **H01L 21/331** (2006.01); **H01L 21/336** (2006.01); **H01L 29/73** (2006.01); **H01L 29/786** (2006.01); **H01L 29/812** (2006.01); **H01L 33/00** (2010.01)

CPC (source: EP KR US)  
**C23C 16/27** (2013.01 - KR); **C23C 16/274** (2013.01 - EP US); **C23C 16/278** (2013.01 - EP US); **C30B 25/105** (2013.01 - EP US); **C30B 29/04** (2013.01 - EP US); **C30B 33/02** (2013.01 - EP US); **C30B 33/06** (2013.01 - EP US); **H01L 21/02013** (2013.01 - EP US); **H01L 21/02027** (2013.01 - EP US); **H01L 21/02376** (2013.01 - EP US); **H01L 21/02433** (2013.01 - EP US); **H01L 21/02527** (2013.01 - EP US); **H01L 21/02579** (2013.01 - EP US); **H01L 21/02609** (2013.01 - EP US); **H01L 21/0262** (2013.01 - EP US); **H01L 21/0405** (2013.01 - EP US); **H01L 21/0415** (2013.01 - EP US); **H01L 21/18** (2013.01 - KR); **H01L 21/324** (2013.01 - EP US); **H01L 29/045** (2013.01 - EP US); **H01L 29/45** (2013.01 - EP US); **H01L 29/66037** (2013.01 - EP US); **H01L 29/66045** (2013.01 - EP US); **H01L 29/66742** (2013.01 - EP US); **H01L 29/66856** (2013.01 - EP US); **H01L 29/73** (2013.01 - KR); **H01L 29/732** (2013.01 - EP US); **H01L 29/78684** (2013.01 - EP US); **H01L 29/812** (2013.01 - EP KR US); **H01L 33/0054** (2013.01 - EP US); **H01L 29/1602** (2013.01 - EP US); **H01L 29/78** (2013.01 - EP US); **H01L 2924/0002** (2013.01 - EP US)

Citation (search report)  

- [Y] EP 0702413 A2 19960320 - SUMITOMO ELECTRIC INDUSTRIES [JP]
- [Y] US 4982243 A 19910101 - NAKAHATA HIDEAKI [JP], et al
- [Y] EP 1179621 A1 20020213 - JAPAN SCIENCE & TECH CORP [JP], et al
- See references of WO 2006137401A1

Cited by  
EP2400533A2; US11569381B2; EP3432361B1

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